CLAIMS:

1.   A face recognition and/or verification system including the step of registering a persons actual face wherein an image of said actual face is captured and synthesized to create a plurality of face prototypes, and wherein said face prototypes are stored for later analysis and comparison with a captured image to be recognised or verified.

2.   The system as claimed in claim 1 wherein said face prototypes represent possible appearances of said actual face under various lighting conditions, varying facial expressions, varying facial orientations, and/or modeling errors.

3.   The system as claimed in claim 1, wherein comparison of said face prototypes and captured image uses a face matching algorithm.

4.   The system as claimed in claim 1, wherein comparison of said face prototypes and captured image uses face templates or feature vectors.

5.   The system as claimed in any preceding claim, wherein synthesizing of said actual face includes normalising said actual face image.

6.   The system as claimed in claim 5, wherein normalising includes rotating said actual face image to bring eyes of said actual face image to a horizontal plane.

7.   The system as claimed in claim 5 or claim 6, wherein normalising includes scaling said actual face image such that the eyes are a fixed distance apart.

8.   The system as claimed in claim 7, wherein said eyes are fixed at 50 pixels apart.

9.   The system as claimed in any preceding claim wherein the area above the persons eyebrows and below the persons mouth is not synthesized.

10.   The system as claimed in any preceding claim wherein synthesizing of
5   said actual face includes determining alternative positions for each eye so as to compensate for possible errors.

11.   The system as claimed in claim 10, wherein five alternative positions are determined for each eye.
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12.   The system as claimed in any preceding claim wherein synthesizing of said actual face includes applying at least one predefined lighting mask to said actual face image.

15   13.   The system as claimed in claim 12, wherein three to 16 predefined lighting masks are used.

14.   The system as claimed in any preceding claim wherein synthesizing of said actual face includes applying at least one predefined warping mask to said
20   actual face image.

15.   The system as claimed in claim 14, wherein 25 predefined warping masks are used.

25   16.   The system as claimed in claim 12 or claim 13, wherein said at least one lighting mask includes photometric transform.

17.   The system as claimed in claim 14 or claim 15, wherein said at least one warping mask includes geometric transform.
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18.   The system as claimed in claim 17, wherein said geometric transform is estimated using optical flow estimation.

19.   The system as claimed in claim 16, wherein said photometric transform includes at least one of:

        algorithmic function, exponential stretch, vertical shadow, horizontal shadow and differentiating image.

20.   A facial prototype synthesis system wherein an image of a persons actual face is used to create a plurality of face prototypes, said face prototypes representing possible appearances of said actual face under various lighting conditions, varying facial expressions, varying facial orientations, and/or modeling errors, and wherein said face prototypes are stored for later use

21.   The system as claimed in claim 20, wherein said actual face image is normalized prior to creating said face prototypes.

22.   The system as claimed in claim 21, wherein normalising includes rotating said actual face image to bring eyes of said actual face image to a horizontal plane.

23.   The system as claimed in claim 21 or claim 22, wherein normalising includes scaling said actual face image such that the eyes are a fixed distance apart.

24.   The system as claimed in claim 23, wherein said eyes are fixed at 50 pixels apart.

25.   The system as claimed in any one of claims 20 to 24, wherein the area above the persons eyebrows and below the persons mouth is not synthesized.

26.   The system as claimed in any one of claims 20 to 25, wherein to create said face prototypes said system determines alternative positions for each eye so as to compensate for possible errors.

27.   The system as claimed in claim 26, wherein five alternative positions are determined for each eye.

28.   The system as claimed in any one of claims 20 to 27 wherein to create said face prototypes said system applies at least one predefined lighting mask to said actual face image.

29.   The system as claimed in claim 28, wherein three to 16 predefined lighting masks are used.

30.   The system as claimed in one of claims 20 to 29 wherein to create said face prototypes said system applies at least one predefined warping mask to said actual face image.

31.   The system as claimed in claim 30, wherein 25 predefined warping masks are used.

32.   The system as claimed in claim 28 or claim 29, wherein said at least one lighting mask includes photometric transform.

33.   The system as claimed in claim 30 or claim 31, wherein said at least one warping mask includes geometric transform.

34.   The system as claimed in claim 33, wherein said geometric transform is estimated using optical flow estimation.

35.   The system as claimed in claim 32, wherein said photometric transform includes at least one of:

        algorithmic function, exponential stretch, vertical shadow, horizontal shadow and differentiating image.

36.   The system as claimed in claim 20, wherein said face prototypes are generated by applying photometric and/or geometric transforms to said image.

37.   A facial prototype synthesis system wherein an image of a persons actual face is normalised and synthesized by determining possible alternative eye positions and applying at least one mask to said image to create a plurality of face prototypes, and wherein said face prototypes represent possible appearances of said actual face under various lighting conditions, varying facial expressions, varying facial orientations, and/or modeling errors.